TCT-455

The Clinical Impact of Preprocedural Anemia with High Neutrophile to Lymphocyte Ratio in Patients with ST-Elevation Myocardial Infarction Undergoing Primary Percutaneous Coronary Intervention

Kyung Hoon Cho, Myung Ho Jeong, Keun-Ho Park, Min Goo Lee, Jum Suk Ko, Doo Sun Sim, Nam Sik Yoon, Hyun Ju Yoon, Young Joon Hong, Hyung Wook Park, Ju Han Kim, Youngkeun Ahn, Jeong Gwan Cho, Jong Chun Park, Jung Chaee Kang
The Heart Center of Chonnam National University Hospital, Gwangju, Korea, Republic of

Background: A complete blood count is the most available laboratory test in the era of percutaneous coronary intervention (PCI) for ST-elevation myocardial infarction (STEMI). The aim of the present study was to assess the significance of anemia with high neutrophile to lymphocyte ratio (N/L) for risk stratification in patients with STEMI.
Methods: We analyzed 801 consecutive patients (63 ± 13 years, male 74 %) with STEMI treated primary PCI within 12 hours of onset of symptoms in a single university center, from November 2005 to June 2009. Patients with cardiogenic shock or underlying malignancy were excluded, and 739 patients were included in the final analysis. A complete blood count were measured at admission. Patients were divided into three groups based on the median level of N/L (≥ 4 or < 4) and the presensce of anemia (hemoglobin < 13 g/dl in men and <12 g/dl in women): I (low N/L & no anemia, n=293), II (no group I or III, n=340), and III (high N/L & anemia, n=106).
Results: During 6 month follow-up, we registered 43 deaths (5.9%). Age, comorbidities and unfavorable hemodynamic status increased as the group increased. The clinical outcome at hospital, 1 month and 6 months after PCI showed worse results as the group increased: 15%, 19% and 33% of in-hospital complication (p<0.001), 3%, 8% and 15% of 1 month composite major cardiac events (p<0.001), and 1%, 8% and 15% of 6 month deaths (p<0.001) occurred from group 1 to 3, respectively. In a Cox proportional hazard model, after adjusting for standard risk factors, group III showed the considerable mortality risk at 6 month follow up (hazard ratio 6.6, 95% confidence interval 1.4 to 30.8, p = 0.016) with the group I as the reference. Other independent predictors for 6 month mortality included age ≥ 75, 65 ≤ age < 75, Killip class > 1, left ventricular ejection fraction < 55% and creatinine >1.3 mg/dL.
Conclusion: The preprocedural anemia with high N/L indicates the considerable short-term mortality risk compared with low N/L with no anemia in patients with STEMI treated primary PCI. Therefore, patients with preprocedural anemia and high N/L requires more thoughtful interventional or medical approach in the era of primary PCI for ST-elevation myocardial infarction.

TCT-456

Impact of Baseline hs-CRP level on Early and Late Stent Thrombosis After Acute MI; 2-year Results of the HORIZONS-AMI Study

Kurt Huber[1], Roxana Mehran[2], Gregg W. Stone[2], Giulio Guagliumi[3], Bruce Brodie[4], Dariusz Dudek[5], Bernhard Witzenbichler[6], Rudolf Jarai[1], Alexandra Lansky[7], George Dangas[2]
[1]Wilhelminenhospital, Vienna, Austria; [2]Columbia University Medical Center and the Cardiovascular Research Foundation, New York, NY; [3]Ospedali Riuniti Di Bergamo, Bergamo, Italy; [4]Moses Cone Heart and Vascular Center, Greensboro, NC; [5]Jagiellonian University, Krakow, Poland; [6]Charite Universitätmedizin - Campus Benjamin Franklin, Berlin, Germany; [7]Columbia University Medical Center, New York, NY

Background: Hs-CRP levels have been associated with adverse clinical outcome in patients with coronary artery disease. We investigated the clinical impact of elevated hs-CRP on stent thrombosis after 2-year following STEMI PCI in the HORIZONS-AMI trial.
Methods: A total of 2234 STEMI patients enrolled in the HORIZONS-AMI trial had baseline hs-CRP levels measured in the emergency room as part of the study protocol. We compared the 2-year clinical outcomes between the low (n=1172, CRP≤0.5mg/dl) and high(n=1062, CRP>0.5mg/dl) hs-CRP groups according to the median cut-off value.
Results: The low vs. high CRP group differed significantly (p<0.05) in male gender (78% vs 74%), hyperlipidemia(46% vs 39%), current smoking (43% vs. 50%), family history of premature CAD (32% vs 25%), previous CABG (3.7% vs. 1.7%), LVEF<40% (11% vs 14%) and anemia (8.7% vs. 13%). No differences existed in baseline and study medications. In procedure, significant differences were lesion length >26mm (21% vs 17%), radial access (2.3% vs 11%), direct stenting (34% vs 27%), with more vessels and lesions treated in the low CRP group. PCI strategy and timing did not differ. Home treatment with aspirin and clopidogrel was more frequent in the high CRP group; adherence to long-term therapy did not differ overtime, except 1-year use of clopidogrel (68% vs 62%, p=0.002).
Contrast nephropathy occurred 15% vs 18% (p=0.06); 30-day and 2-year outcomes are summarized in the Table. Multivariate analysis models will be available at presentation.

	Low CRP (n=1172)	High CRP (n=1062)	P-value
30-day Major Bleed	8.4%	6.3%	0.0523
30-d MACE	4.4%	5.8%	0.1669
1-year MACE	11%	13%	0.3147
2-year MACE	18%	19%	0.5952
Stent thrombosis			
Acute	0.8%	0.9%	0.8327
Subacute	1.3%	1.6%	0.6441
Late	0.6%	1.4%	0.0598
Very Late	0.9%	1.4%	0.3321
Late + Very Late	1.4%	2.8%	0.0287
After day1-to-2 year rate	2.6%	4.4%	0.0360
Cumulative 2-year rate	3.5%	5.2%	0.0633

Conclusions: High baseline hs-CRP level was a marker of less significant comorbidities (except smoking) and showed a trend towards less bleeding. We documented more frequent late and very late stent thrombosis in the high hs-CRP group.

TCT-457

The Impact of the Insurance Status on Door-to-Balloon Times in Patients Undergoing Primary Percutaneous Coronary Intervention

Lauren Hofmann, Robert M. Minutello, William Borden, Luke Kim, Cenap Undemir, Geoffrey Bergman, S. Chiu Wong, Dmitriy N. Feldman
New York Presbyterian Hospital - Weill Cornell Medical College, New York, NY

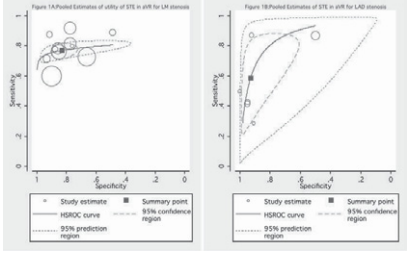
Background: Reduced door-to-balloon times in primary percutaneous coronary intervention (PCI) for STEMI have been associated with lower cardiovascular mortality rates. Prior studies have demonstrated a disparity in cardiovascular care in different racial and ethnic groups; however, limited data exist regarding the contribution of sociodemographic or economic factors to timing of health care delivery in patients with STEMI. We examined the impact of the insurance status on door-to-balloon times in patients undergoing primary PCI.
Methods: We analyzed 244 consecutive patients from 01/2004-01/2010, who presented emergently with STEMI within 12 hours of symptom onset and who underwent primary PCI within 3 hours of symptoms. Patients were categorized according to the insurance status (public insurance, private insurance, and no insurance), and door-to-balloon times were compared in different insurance groups.
Results: Of the 244 study patients, 107 (43.9%) had private insurance, 88 (36.1%) had Medicare, 23 (9.4%) had Medicaid, and 28 (11.5%) had no insurance. The mean age of the study population was 63.2 years, and 70% were men. Median door-to-balloon time was 83.5 minutes (interquartile range, 63-106 min), median chest pain-to-balloon time was 209 minutes (interquartile range, 140-363 min). There was no difference in door-to-balloon times between patients with vs. without insurance (mean time 80.5±29.6 min vs. 89.2±32.9 min, p=0.17). Also, there was no difference in door-to-balloon times between patients with private insurance or Medicare vs. patients with Medicaid or without insurance (mean time 89.5±32.4 min vs. 84.5±35.2 min, p=0.37). In addition, there was no difference in door-to-balloon times between privately vs. non-privately insured/no insurance patients (mean time 89.2±32.9 min vs. 88.0±33.2 min, p=0.77). Patients with any insurance had significantly shorter chest pain-to-balloon times compared with those without any insurance (mean time 216.7 min vs. 313.3 min, p=0.012).
Conclusions: The results of this analysis suggest that emergent performance of primary PCI and door-to-balloon times are not influenced by the insurance status. However, patients without any insurance have delayed presentations to the hospital from the time of symptom onset and further measures of public awareness are needed to minimize such delays.

TCT-458

Utility Of ST Segment Changes In Lead aVR To Identify The Culprit Lesion In Acute Myocardial Infarction: An Updated Meta-analysis On Sensitivity And Specificity

Aleksandr Korniyenko, Juan Pablo Cordova, Ronaldo Sevilla Berrios, Girish Nadkarni, Carlos Alviar, Eyal Herzog
St Luke's Roosevelt Hospital, New York, NY

Background: ST segment changes in aVR have been associated with specific angiographic findings during acute myocardial infarction (AMI), more precisely with left main (LM) and proximal left anterior descending (LAD) lesions. The utility of this finding to accurately identify the culprit lesion has been controversial. Thus, we aim to assess the specificity and sensitivity of ST segment elevation (STE) in aVR by reviewing and pooling estimates from existing literature in a form of meta-analysis.
Methods: A systematic search strategy was performed in MEDLINE and EMBASE in order to isolate studies that analyzed the association of aVR STE>0.5mm with LM and proximal LAD stenosis as a culprit lesion, confirmed by angiography.
Results: Twelve studies investigated if aVR STE is useful for the diagnosis of LM stenosis and seven for LAD stenosis. For LM, pooled data showed a sensitivity of 76 %(95% CI 73-80); specificity of 83 %(95% CI 76-88%); Positive Likelihood Ratio (LR) of 4.5(95% 3.19-6.54) and Negative LR of 0.28(0.24-0.33) {Figure 1A}. For proximal LAD stenosis, pooled data showed a sensitivity of 58 %(95% CI 37-77); specificity of 93 %(95% CI 81-97%); Positive LR of 8.3(95% 3.5-19.5) and Negative LR of 0.44(0.28-0.71) {Figure 1B}



Conclusions: aVR STE is a potential useful tool for the identification of LM and proximal LAD disease during AMI. Due to its lower sensitivity, the clinician should have a high index of suspicion during the appropriate clinical scenario given that aVR lead has high specificity for both LM and proximal LAD stenosis.

TCT-459

Safety of Immediate Reversal of Anticoagulation by Protamine to Reduce Bleeding Complications after Infarct Artery Stenting for Acute Myocardial Infarction and Adjunctive Abciximab Therapy

Guido Parodi[1], Giuseppe De Luca[2], Benedetta Bellandi[1], Renato Valenti[1], Angela Migliorini[1], Nazario Carrabba[1], Ruben Vergara[1], David Antoniucci[1]
[1]Invasive Cardiology, Florence, Italy[2]Division of Cardiology, Novara, Italy

Background: Infarct artery stenting with adjunctive abciximab therapy is a widely used treatment for patients with ST elevation acute myocardial infarction (STEMI). However, the related bleeding complications have been associated with a worse clinical outcome. Randomized trials in elective patients have shown that postprocedural protamine administration is safe and associated with

POSTER

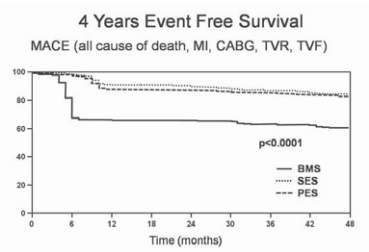
a significant reduction in bleeding complications. The aim of the current study was to evaluate in STEMI patients undergoing primary percutaneous coronary intervention (PCI) with stenting and abciximab whether immediate reversal of anticoagulation by protamine is safe and associated with a reduction in the occurrence of bleeding complications.
Methods: Two-hundreds and 63 patients with STEMI had immediate reversal of anticoagulation after infarct artery stenting and received abciximab therapy without heparin infusion (Group 1). These patients were compared with a control group of 275 consecutive patients treated with the standard heparin therapy: bolus in order to achieve an activated coagulation time of 250 to 300 seconds during PCI followed by 12-hour heparin infusion (7UI/kg/h; Group 2). Patients undergoing IABP implantation were excluded.
Results: The 2 groups were similar in all baseline characteristics. There were no differences in in-hospital mortality, reinfarction, urgent target vessel revascularization, stroke and acute or subacute stent thrombosis rates, while Group 1 patients showed a lower incidence of major bleeding complications (ACUITY scale: 1.1% versus 4.0%, p=0.035) and a shorter length of hospital stay (3.5±1.7 days versus 4.0±1.6 days, p=0.002) as compared with heparin treated patients.
Conclusions: Among patients undergoing primary stenting with abciximab administration, immediate post-PCI reversal anticoagulation by protamine is safe and associated with a significant reduction in major bleeding complications.

TCT-460

Four-Year Follow-Up Patients with ST-Segment Elevation Acute Myocardial Infarction Treated with Sirolimus-Eluting Stent and Paclitaxel-Eluting Stent: Multicenter Registry in Asia

Sunao Nakamura[1], Hisao Ogawa[2], Jang-Ho Bae[3], Yeo H Cahyadi[4], Wasan Udayachalerm[5], Damras Tresukosol[6], Sudaratana Tansuphaswadikul[7]
[1]New Tokyo Hospital, Matsudo, Japan[2]Kumamoto University Hospital, Kumamoto, Japan[3]Konyang University Hospital, Daejeon, Korea, Republic of[4]Husada Hospital, Jakarta, Indonesia[5]King Chulalongkorn Memorial Hospital, Bangkok, Thailand[6]Mahidol University Siriraj Hospital, Bangkok, Thailand[7]Chest Disease Institute, Bangkok, Thailand

Background: Previous clinical study utilizing Sirolimus-eluting stent (SES) and Paclitaxel-eluting stent (PES) in simple coronary lesions demonstrated an impressive reduction in intimal hyperplasia and restenosis. However, clinical efficacy of SES and PES in treating patients with ST-segment elevation myocardial infarction (STEMI) has not been validated.
Methods: We assessed baseline clinical and angiographic characteristics, in-hospital and 12, 24 and 36-month major adverse cardiac events (MACE) in 1,838 consecutive STEMI patients who received on SES, PES or bare metal stents (BMS) without cardiogenic shock undergoing emergent PCI.
Results: The baseline clinical characteristics between 3 groups were similar. See table for the clinical results.



Conclusion: Implantation of SES and PES in STEMI patients is not associated with any risk of adverse in-hospital events, and reduced the need for repeat PCI at follow-up.

TCT-461

Impact of Baseline Thrombocytopenia on the Early and Late Outcomes After ST-Elevation Myocardial Infarction Treated With Primary Angioplasty: Analysis from the HORIZONS AMI Trial

Diaa El Din Abd El Hakim, Jr.[1,2,3,4], George D Dangas, Sr.[1], Adriano Caixeta, III[1], Eugenia Nikolsky, Sr.[1], Alexandra J Lansky, Sr.[1], Jeffrey W Moses, Sr.[1], Tullio Palmerini, II[1], Martin Fahy, III[1], Harvey D White, Sr.[2], E Magnus Ohman, Sr.[3], Steven V Manoukian, Sr.[4], Roxana Mehran, Sr.[1], Gregg W Stone, Sr.[1]
[1]CRF, Columbia University Medical Center, New York, NY;[2]Auckland City Hospital, Auckland, New Zealand[3]Duke University Medical Center, Durham, NC;[4]Emory University School of Medicine, Atlanta, GA

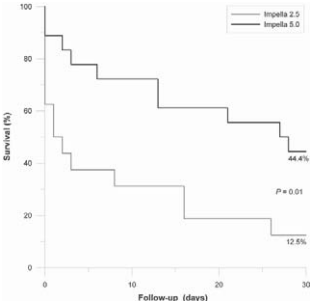
Introduction: Thrombocytopenia is a common abnormality in patients presenting with acute coronary syndrome and treated with anti-thrombotic therapy. Whether baseline thrombocytopenia has any influence on the outcome of patient treated with primary angioplasty for acute myocardial infarction is unknown. In this study our aim was to detect the impact of baseline thrombocytopenia on the early and late outcomes of this group of patients
Methods: As an analysis of HORIZONS-AMI trial we compared the short and long term outcomes expressed as primary end points; net adverse cardiac events (major adverse cardiac events and or bleeding) in patients with baseline thrombocytopenia with a control group.
Results: Baseline thrombocytopenia was found in 4% of patients and was associated with a higher incidence of cardiovascular mortality; bleeding and composite ischemic end points at short and long term follow up. The 30-day death rate, bleeding and major cardiac events were 6.2%; 11.9%; 9.6% in the thrombocytopenia group consequently compared with 2.1%; 7%; 5.2% in the control group (p< 0.05 for all comparisons) while at 2-year follow up the above mentioned rates were11.3%;12.7%; 24.7% respectively in the thrombocytopenia group compared with 5.1% ;7.9%; 18.5% in the control group (p< 0.05 for all comparisons).However, thrombocytopenia was not an independent predictor of any adverse events by multivariate analysis.
Conclusion: This analysis showed that baseline thrombocytopenia in patients with acute MI undergoing immediate catheterization and primary PCI is a readily available marker of increased future adverse events, related to both ischemia and bleeding.

TCT-462

The Impella Devices For Patients In Profound Cardiogenic Shock; The AMC ICU Experience

Annemarie E Engstrom, Ricardo Cocchieri, Antoine H Driessen, Krischan D Sjauw, Marije M Vis, Jan Baan, Jr., Karel T Koch, Wim K Lagrand, Jos A P van der Sloot, Jan Tijssen, Robbert J de Winter, Bas A de Mol, Jan J Piek, José P Henriques
AMC, Amsterdam, Netherlands

Background: Cardiogenic shock (CS) remains an important therapeutic challenge, with high in-hospital mortality rates. Mechanical circulatory support may be beneficial in these patients. As the efficacy of the intra-aortic balloon pump (IABP) seems limited, new devices, such as the Impella system, have been developed for this purpose. Our current purpose was to describe our experience with the Impella system in patients presenting in profound CS, who were admitted to our intensive care unit (ICU).
Methods: From January 2004 through April 2010, 41 patients in profound CS requiring mechanical ventilation were admitted to our ICU and treated with either the Impella 2.5 or the Impella 5.0 percutaneous left ventricular assist device. Baseline and follow-up characteristics were collected retrospectively and entered into a dedicated database.
Results: Thirty out of 41 patients were in CS as a complication of STEMI. Within the study cohort, 16 patients received treatment with the Impella 2.5, 18 patients were treated with the Impella 5.0 and 7 patients were treated with the Impella 2.5 and subsequently upgraded to treatment with the Impella 5.0. Thirty-day survival rates in patients treated with the Impella 2.5 and Impella 5.0 were 12.5% and 44.4%, respectively (p=0.01). For the upgraded patients, 30-day survival after upgrade was 42.9%.



Conclusion: For the highly selected group of patients with profound and refractory CS, either as a complication of STEMI or post-cardiotomy, mechanical support by means of the Impella 5.0 is associated with lower 30-day mortality rates when compared to mechanical support with the Impella 2.5 only.

TCT-463

Survival Following Acute ST Elevation Myocardial Infarction Complicated By Out Of Hospital Cardiopulmonary Arrest

Fizzah A Choudry, Roshan P Weerackody, Peter G Mills, Ajay K Jain
London Chest Hospital, London, United Kingdom

Background: ST elevation myocardial infarction (STEMI) complicated by out of hospital cardiopulmonary arrest (OOHCA) is associated with significant morbidity and mortality. However there is little data available in the era of primary PCI regarding outcome of STEMI complicated by OOHCA. We sought to identify the characteristics that determine outcome following OOHCA due to STEMI.
Methods: Between Jan 2008 and Dec 2009 31 patients presenting to a primary PCI centre with OOHCA were identified. The following clinical data were collected for each patient, patient demographics, cardiac risk factors, arrest to arrival time, heart rate, systolic blood pressure, creatinine, degree of ST-segment deviation, cardiac biomarkers, angiographic disease severity and predicted in-hospital mortality using the GRACE risk model was calculated. In hospital MACCE and 12 month all cause mortality was recorded.
Results: The mean age of patients was 61±14 years, 85.5% were male and 49% were transferred to the PCI centre from local hospitals. Cardiovascular risk factors were hypercholesterolaemia (52%), smoking history (52%), diabetes mellitus (43%) and hypertension (39%). In-hospital mortality was 26% among patients presenting with OOHCA. At 12 month follow up 100% of patients who survived the index admission were alive. There were no significant differences in patient demographics or referral source between patients who were alive at discharge compared with those who died. Mean time from cardiac arrest to arrival at the cardiac centre was longer for non survivors (155 minutes) than survivors (95 minutes). Non-survivors were more likely to have three vessel coronary disease (62% (5/8) in non-survivors, 21% (5/23) in survivors), and had a higher predicted in-hospital mortality according to the GRACE risk model (17% in non-survivors, 10.5% in survivors).
Conclusions: There is a five-fold increase in mortality in STEMI patients complicated by OOHCA. In this cohort predictors of poor outcome are a longer time from arrest to arrival at a primary PCI centre, three vessel coronary disease and a higher predicted in-hospital mortality according to the GRACE risk model. Prompt medical assistance and rapid transfer of these patients to a primary PCI centres is likely to improve outcome among patients with STEMI complicated by OOHCA.

TCT-464

Culprit Lesions for Acute ST-Elevation Myocardial Infarction: Anatomically Significant Or Not?

Liam M McCormick[1], Stephen P Hoole[1], David P Dutka[2], Nick E J West[1]
[1]Papworth Hospital, Cambridge, United Kingdom[2]Addenbrooke's Hospital, Cambridge, United Kingdom

Background: Recent data from studies examining fractional flow reserve (FFR) and virtual histology-intravascular ultrasound (VH-IVUS) have confirmed that both functionally- and anatomically-